



# VQ 40DF

TANNOY®



## Product Description

The VQ 40DF (40x40), is a very high output down firing Mid/High loudspeaker systems designed for applications requiring high impact sound reinforcement with class leading pattern control.

The modular design approach allows the sound system designer to create seamless and predictable arrays, or they can be used singly as part of large distributed systems. VQ 40DF addresses the requirement for compact dimensions without compromising performance in any way.

VQ MH elements which are available in various patterns will integrate seamlessly with the VQ 40DF enclosures to facilitate tight pack arrays; the compound angles on the enclosure avoid unsightly spaces between separate cabinets when arrayed horizontally. VQ MB or VS 15DR elements can be added to extend bandwidth and pattern control to lower frequencies.

The VQ 40DF can be configured for use in Single-Amp or Bi-Amp mode, in conjunction with a suitable digital signal processor (DSP).

Horn design involves balancing compromise.....until now.

Our unique approach in keeping what is effectively a Dual Concentric behind a single horn gives us many performance advantages. Performance of the VQ 40DF in terms of accuracy & sound quality is second to none. The VQ horn design principles provide definitive and measurable advantages over multiple-horn and co-axial designs.

Each VQ 40DF incorporates a unique driver technology to radiate a coherent single point source for superior dispersion control when coupled to a PSW™ (Point Source Waveguide). This advanced design aligns the acoustical centres of the transducers providing a single coherent wavefront emanating from the throat. The PSW™ waveguide achieves an optimum balance of extremely well controlled coverage, smooth frequency response, and natural sound character.

For outdoor applications, weather resistant enclosures which incorporate stainless steel hardware are available.

## Features

- "PSW™ Waveguide" - Point source design (Patent applied for).
- Excellent Phase Coherence
- Perfect time alignment without the associated problems of multi source interference
- Compact Dimensions
- Class leading directivity characteristics
- Extremely high sensitivity, therefore high SPL's can be achieved with a very modest amount of amplifier power
- Exceptional transient response

## Applications

- High output long throw applications
- Large Houses of Worship
- Large Corporate AV applications
- Stadiums & Arenas
- Dance Clubs
- Live sound – concert halls, theatres, open-air venue

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## TECHNICAL SPECIFICATIONS

| System                                                       | VQ 40DF                                                                                          |
|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| System Type                                                  | 2-Way Mid/High - Point Source                                                                    |
| Frequency Response (-3dB) <sup>(1)</sup>                     | 400Hz - 23kHz                                                                                    |
| Frequency Range (-10dB) <sup>(1)</sup>                       | 350Hz - 27kHz                                                                                    |
| Operating Modes                                              | Single Amplified<br>Bi-Amp (MF,HF)<br>User Configurable                                          |
| System Sensitivity & Operating Freq. (1W @1m) <sup>(2)</sup> |                                                                                                  |
| Single Amplified                                             |                                                                                                  |
| Passive MF/HF (450Hz - 23kHz)                                | 116dB (2.83V @ 8 Ohms)                                                                           |
| Bi-Amp                                                       |                                                                                                  |
| MF (450Hz - 7kHz)                                            | 116dB (2.83V @ 8 Ohms)                                                                           |
| HF (7kHz - 23kHz)                                            | 114dB (2.83V @ 8 Ohms)                                                                           |
| Dispersion (-6dB)                                            | 40 degrees conical                                                                               |
| Driver Complement                                            |                                                                                                  |
| MF/HF                                                        | Dual Concentric™<br>Compression driver loaded into a single PSW™ Waveguide                       |
| Crossover                                                    |                                                                                                  |
| Single Amplified                                             | Single Amplified - 7kHz (passive)<br>Bi-amp 7kHz (active)<br>Recommended HighPass Filter @ 450Hz |
| Directivity Factor (Q)                                       | 28.2 averaged 1kHz to 10kHz                                                                      |
| Directivity Index (DI)                                       | 14.5 averaged 1kHz to 10kHz                                                                      |
| Rated Maximum SPL <sup>(2)</sup>                             | Average Peak                                                                                     |
| VQ 40DF MF                                                   | 139dB 145dB                                                                                      |
| VQ 40DF HF                                                   | 137dB 143dB                                                                                      |
| VQ 40DF Passive MF/HF                                        | 139dB 145dB                                                                                      |
| Power Handling <sup>(3)</sup>                                | Average Peak                                                                                     |
| MF @ 8 Ohms                                                  | 200W (40V) 400W                                                                                  |
| HF @ 8 Ohms                                                  | 90W (27V) 180W                                                                                   |
| Passive MF/HF @ 8 Ohms                                       | 200W (40V) 400W                                                                                  |
| Recommended Amplifier Power                                  |                                                                                                  |
| MF                                                           | 400W into 8 Ohms                                                                                 |
| HF                                                           | 200W into 8 Ohms                                                                                 |
| Passive MF/HF                                                | 400W into 8 Ohms                                                                                 |
| Nominal Impedance                                            |                                                                                                  |
| MF                                                           | 8 Ohms (6.5 Ohms Minimum)                                                                        |
| HF                                                           | 8 Ohms (8.5 Ohms Minimum)                                                                        |

| Distortion |              |              |
|------------|--------------|--------------|
| 110dBSPL   | 2nd Harmonic | 3rd Harmonic |
| 500Hz      | 0.423        | 0.423        |
| 2kHz       | 0.821        | 0.021        |
| 5kHz       | 1.344        | 0.067        |
| 115dBSPL   |              |              |
| 500Hz      | 2.468        | 0.710        |
| 2kHz       | 1.458        | 0.041        |
| 5kHz       | 2.379        | 0.171        |
| 120dBSPL   |              |              |
| 500Hz      | 4.893        | 1.109        |
| 2kHz       | 2.534        | 0.094        |
| 5kHz       | 4.216        | 0.616        |
| 125dBSPL   |              |              |
| 500Hz      | 8.998        | 3.067        |
| 2kHz       | 4.208        | 0.350        |
| 5kHz       | 8.206        | 2.182        |

### Construction

|            |                                                           |
|------------|-----------------------------------------------------------|
| Enclosure  | 18mm (0.71") birch plywood. Internally braced.            |
| Grille     | Powder coated perforated steel grille                     |
| Finish     | Textured black or white paint (custom colours on request) |
| Connectors | Barrier Strip and Speakon Connectors                      |
| Fittings   | 2 x Recessed carrying handles<br>11 x M10 flying inserts  |
| Dimensions | 500 mm x 694 mm x 515 mm<br>(19.69" x 27.32" x 20.28")    |
| Net Weight | 29kg (63.8 lbs)                                           |

#### Notes:

(1) Average over stated bandwidth. Measured at 3 metres on axis, then referred to 1 metre

(2) Unweighted pink noise input, measured at 3 metres in an anechoic chamber, then referred to 1 metre

(3) Accelerated Life Test (EIA RS426-B)

A full range of measurements, performance data, CLF and Ease™ Data can be downloaded from [www.tannoy.com](http://www.tannoy.com)

Full independent verification of published specifications carried out by NWA Labs, California can also be obtained from the downloads section of [www.tannoy.com](http://www.tannoy.com)

Tannoy operates a policy of continuous research and development. The introduction of new materials or manufacturing methods will always equal or exceed the published specifications, which Tannoy reserves the right to alter without prior notice. Please verify the latest specifications when dealing with critical applications.

### Ordering Information

| PART NUMBER | MODEL NAME | COLOUR | PACKED QUANTITY |
|-------------|------------|--------|-----------------|
| 8001 5780   | VQ 40DF    | BLACK  | 1               |
| 8001 5781   | VQ 40DF    | WHITE  | 1               |

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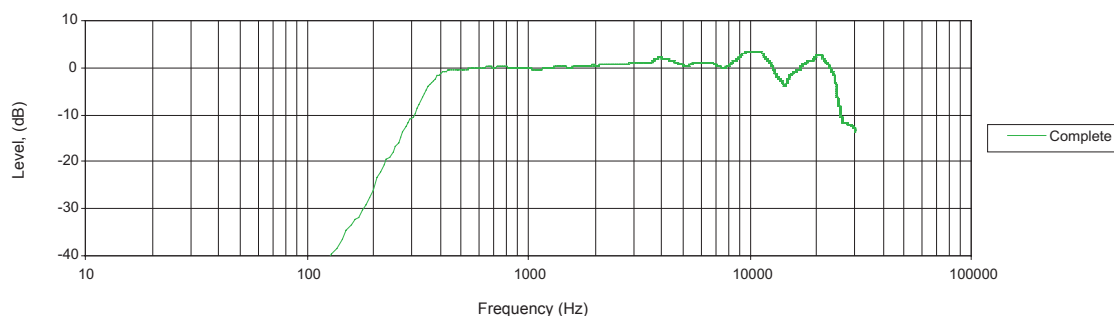


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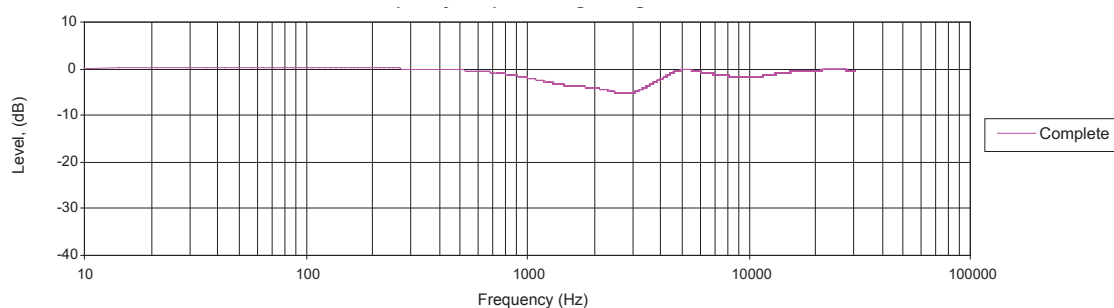
## PERFORMANCE MEASUREMENTS

Frequency Response: Processed



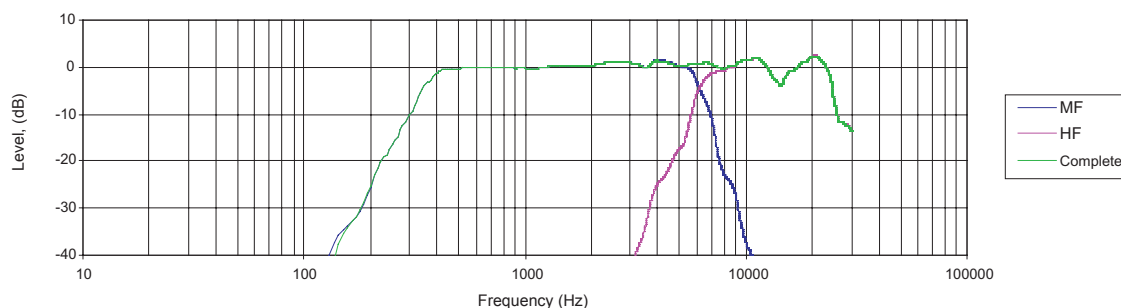
### ANECHOIC FREQUENCY RESPONSE (SINGLE AMP MODE)

Frequency Response: Digital Signal Processor



### ELECTRICAL TRANSFER FUNCTION FOR OPTIMAL OPERATION (SINGLE AMP MODE)

Frequency Response: Processed Bi-amplified



### ANECHOIC FREQUENCY RESPONSE (BI-AMP MODE)

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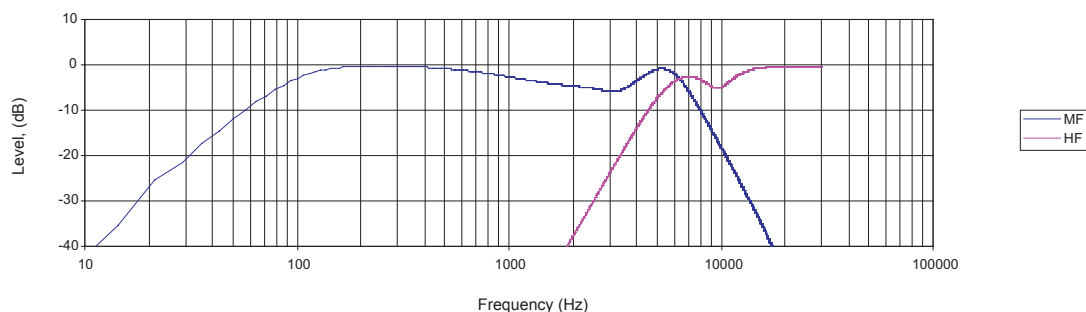


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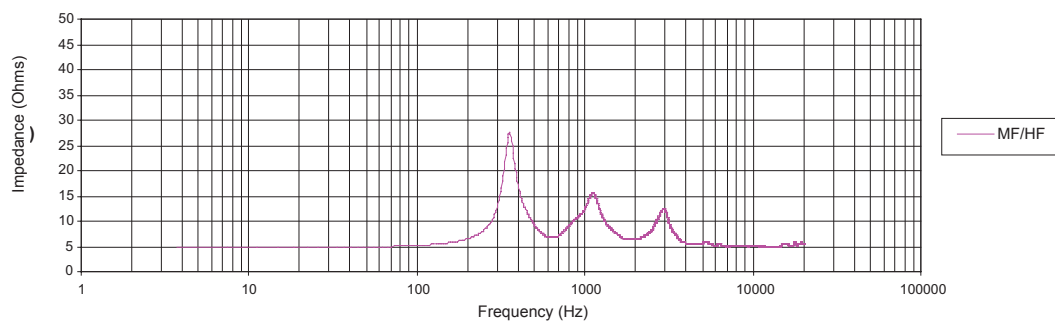
## PERFORMANCE MEASUREMENTS

Frequency Response: Digital Signal Processor



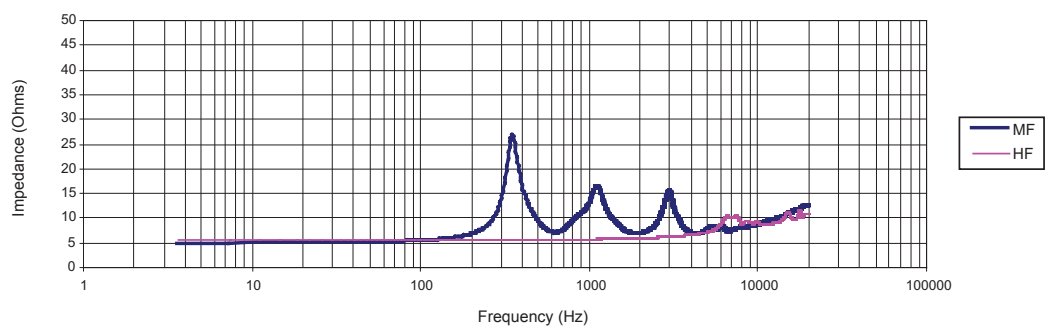
**ELECTRICAL TRANSFER FUNCTION  
FOR OPTIMAL OPERATION  
(BI-AMP MODE)**

Impedance vs frequency



**IMPEDANCE  
(SINGLE AMP MODE)**

Impedance vs frequency



**IMPEDANCE (BI-AMP MODE)**

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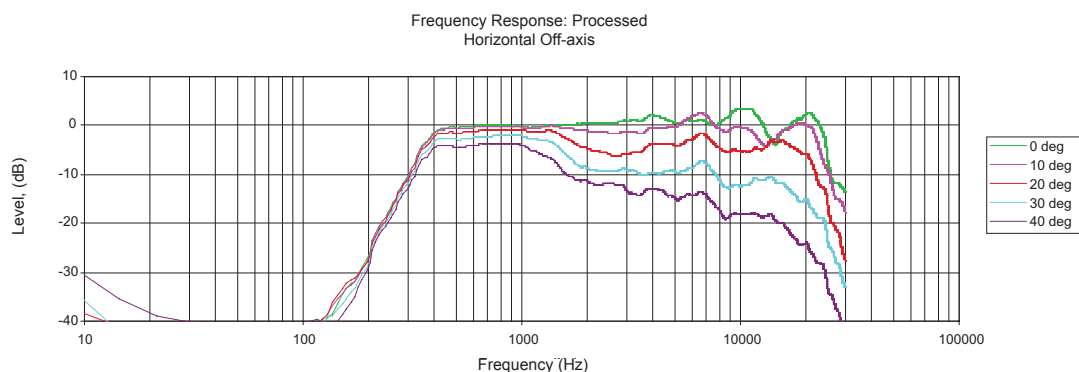
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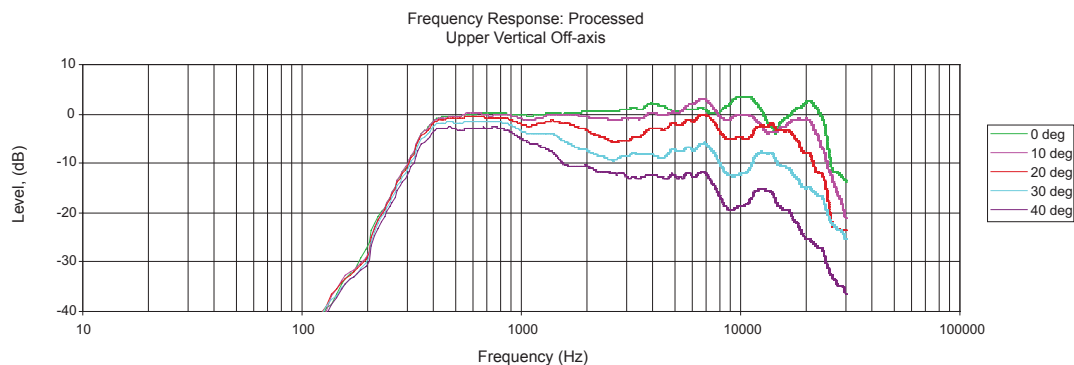
# VQ 40DF

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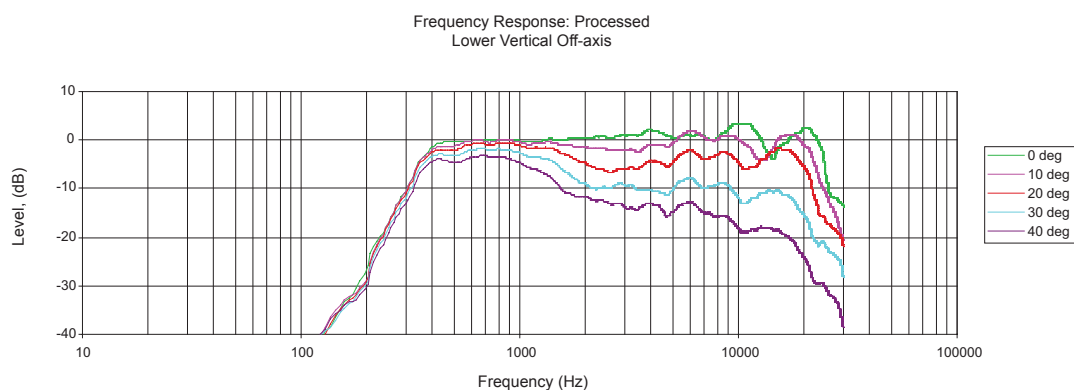
## PERFORMANCE MEASUREMENTS



**HORIZONTAL OFF AXIS RESPONSE  
(SINGLE AMP MODE)**



**UPPER VERTICAL  
OFF AXIS RESPONSE  
(SINGLE AMP MODE)**



**LOWER VERTICAL OFF AXIS  
RESPONSE (SINGLE AMP MODE)**

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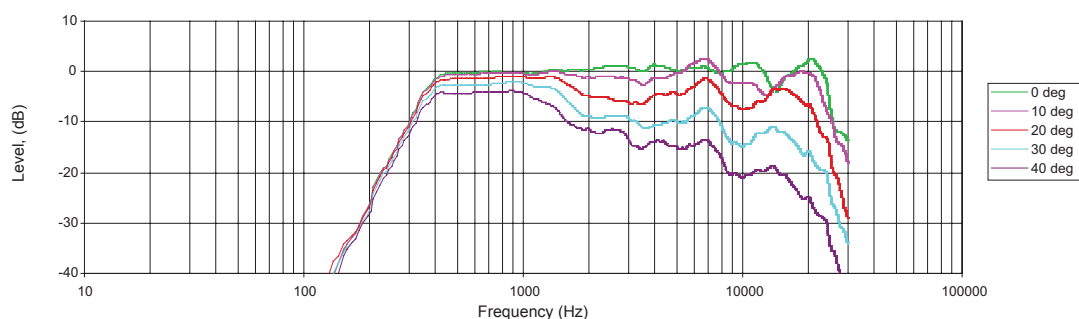


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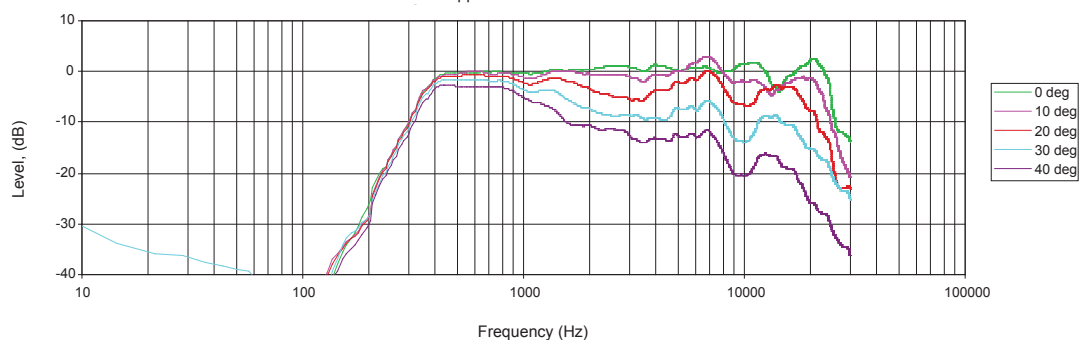
## PERFORMANCE MEASUREMENTS

Frequency Response: Processed Bi-amplified  
Horizontal Off-axis



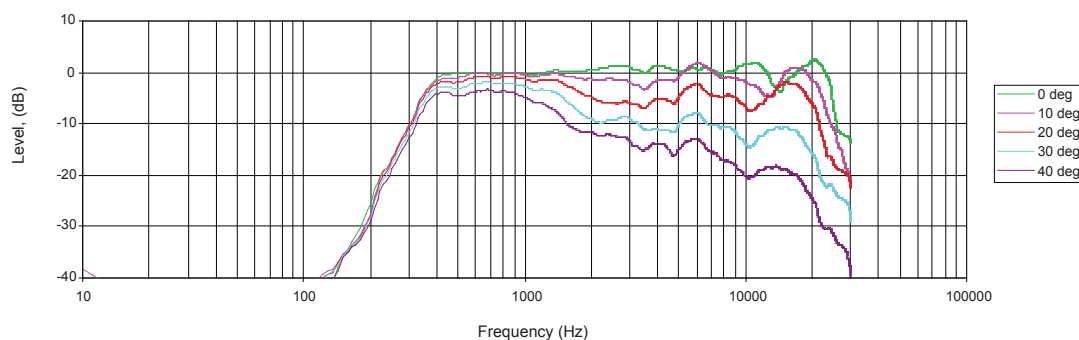
**HORIZONTAL OFF AXIS RESPONSE  
(BI-AMP MODE)**

Frequency Response: Processed Bi-amplified  
Upper Vertical Off-axis



**UPPER VERTICAL  
OFF AXIS RESPONSE  
(BI-AMP MODE)**

Frequency Response: Processed Bi-amplified  
Lower Vertical Off-axis



**LOWER VERTICAL OFF AXIS  
RESPONSE (BI-AMP MODE)**

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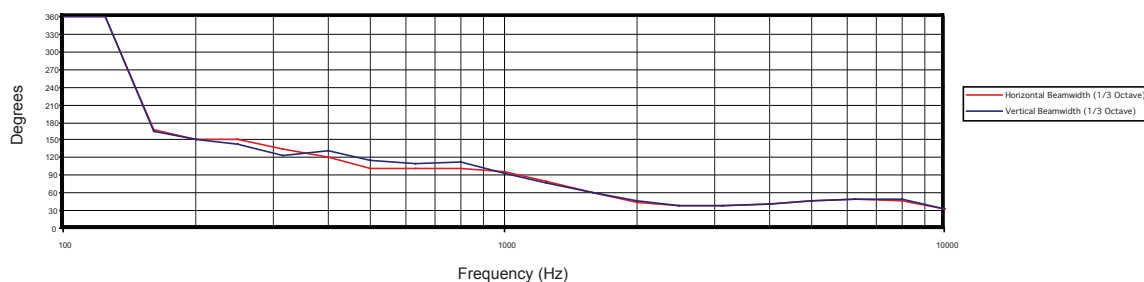


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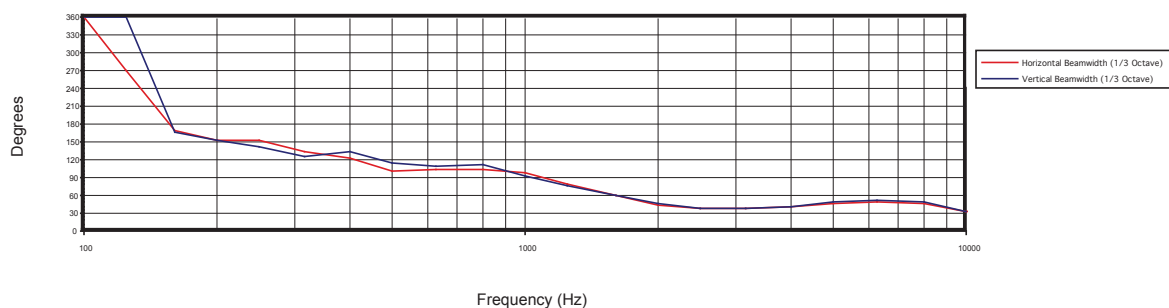
## PERFORMANCE MEASUREMENTS

Beamwidth vs Frequency



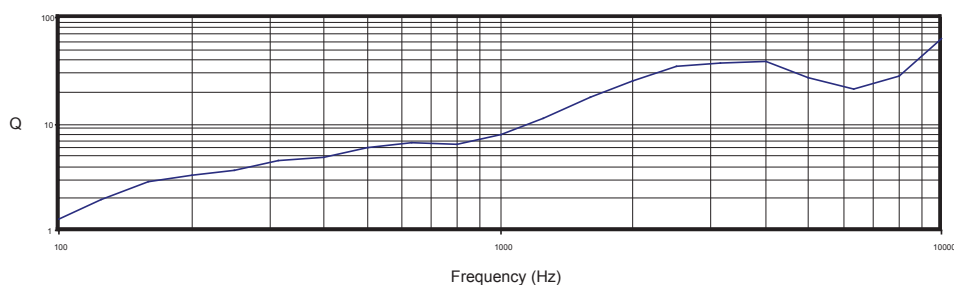
BEAMWIDTH  
(SINGLE AMP MODE)

Beamwidth vs Frequency



BEAMWIDTH  
(BI-AMP MODE)

Q vs Frequency



Q VS FREQUENCY  
(SINGLE AMP MODE)

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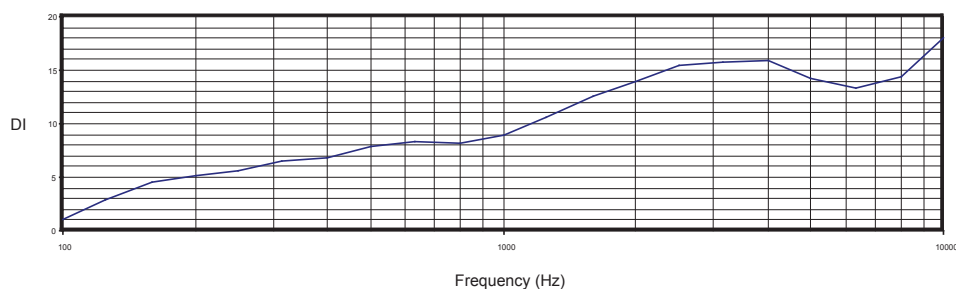


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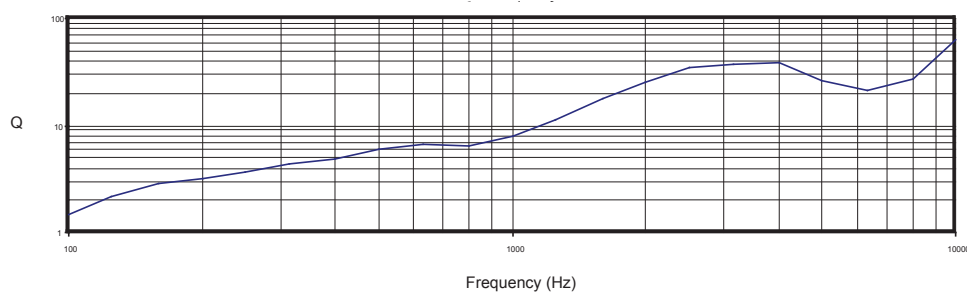
## PERFORMANCE MEASUREMENTS

DI vs Frequency



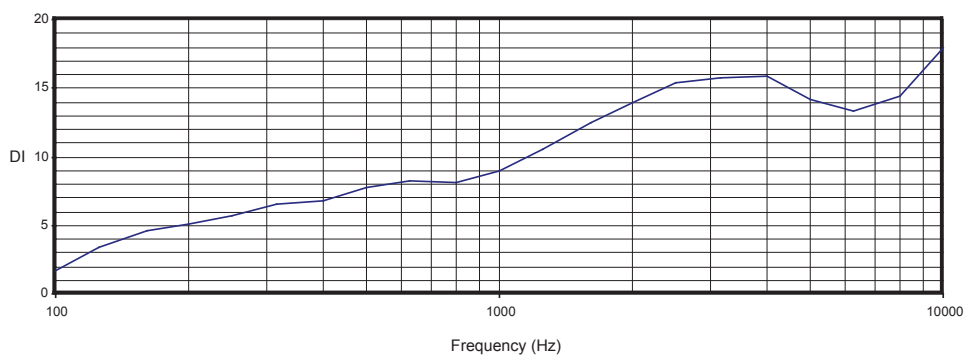
DIRECTIVITY INDEX  
(SINGLE AMP MODE)

Q vs Frequency



BEAMWIDTH  
(BI-AMP MODE)

DI vs Frequency



DIRECTIVITY INDEX  
(BI-AMP MODE))

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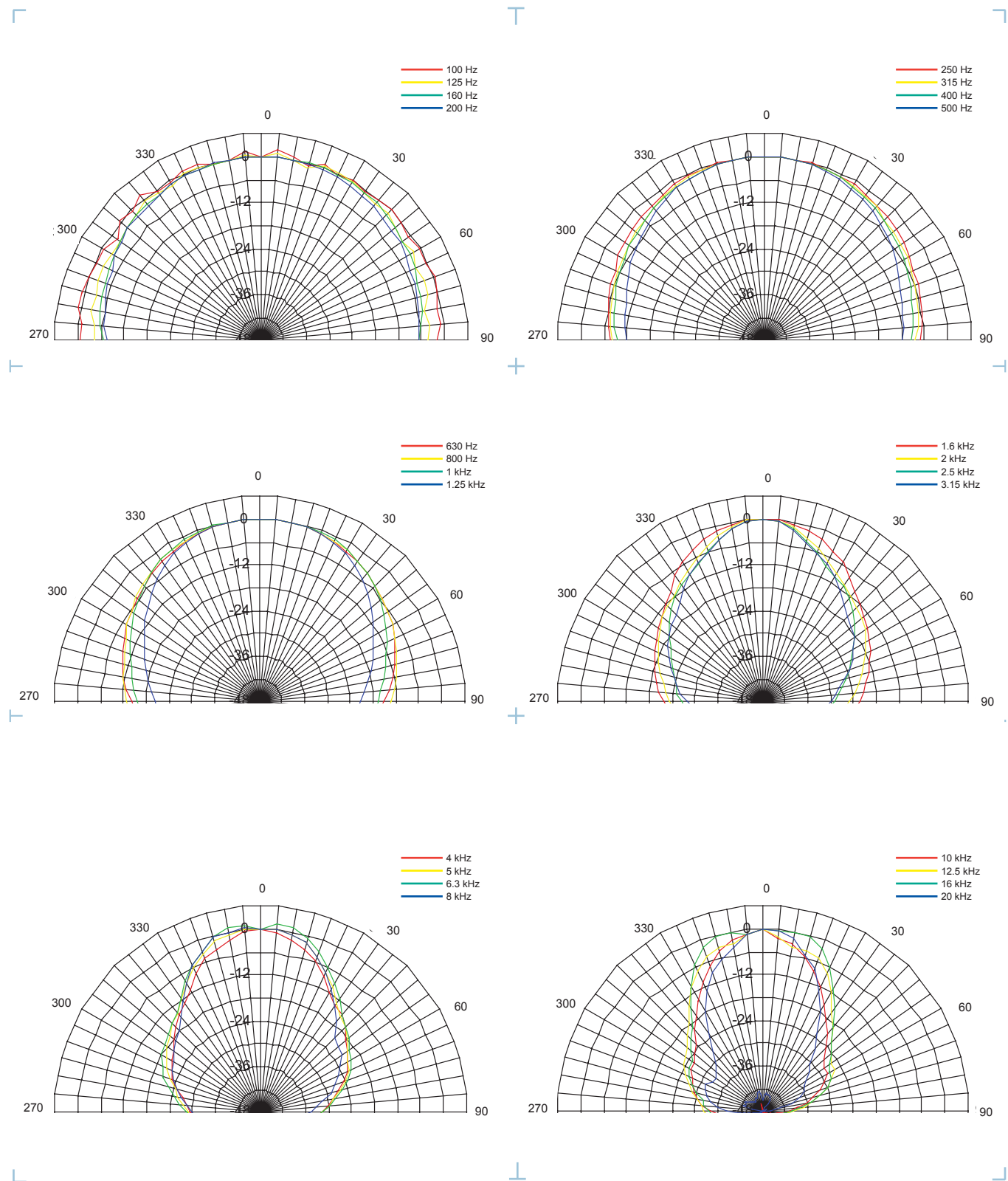
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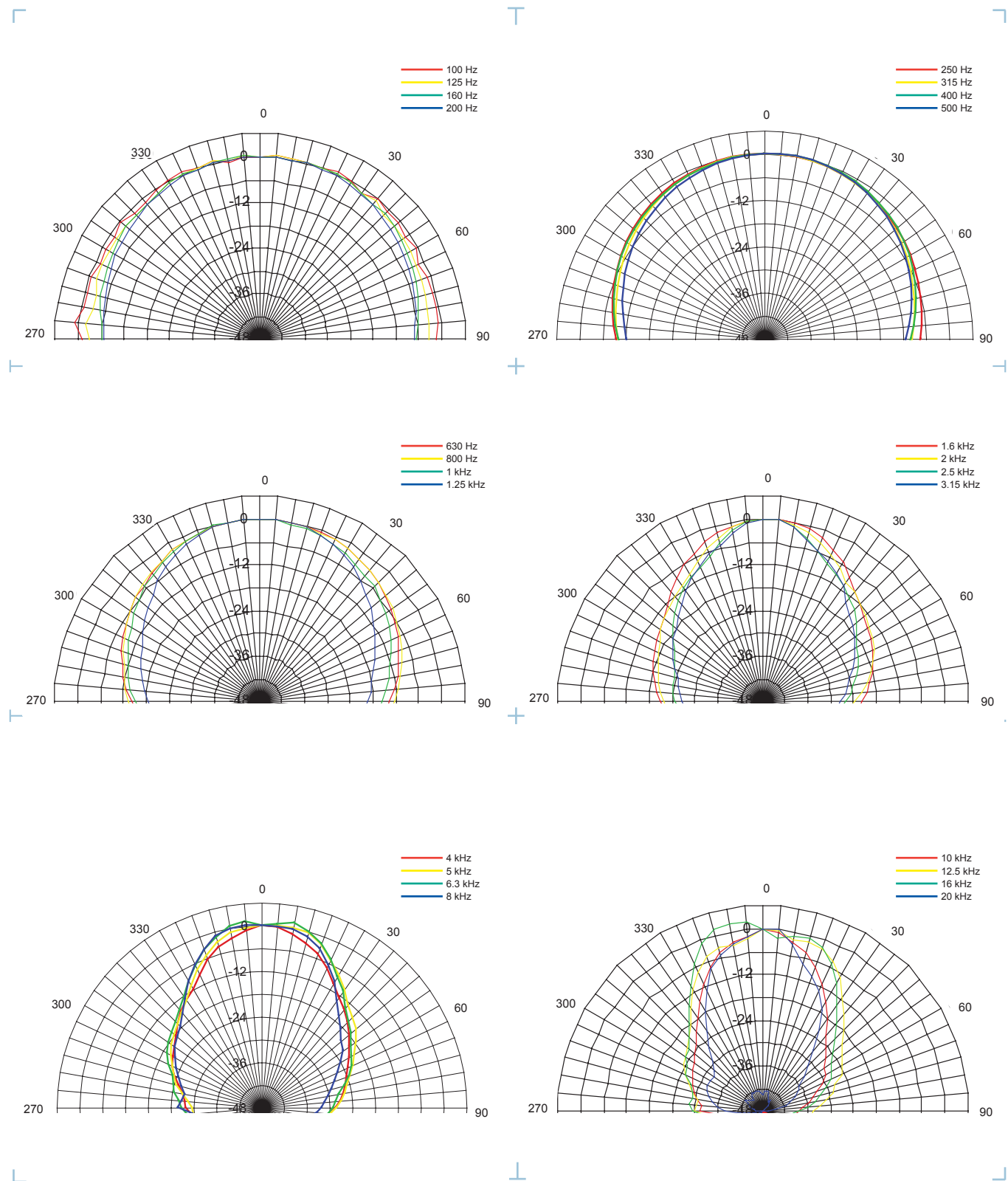
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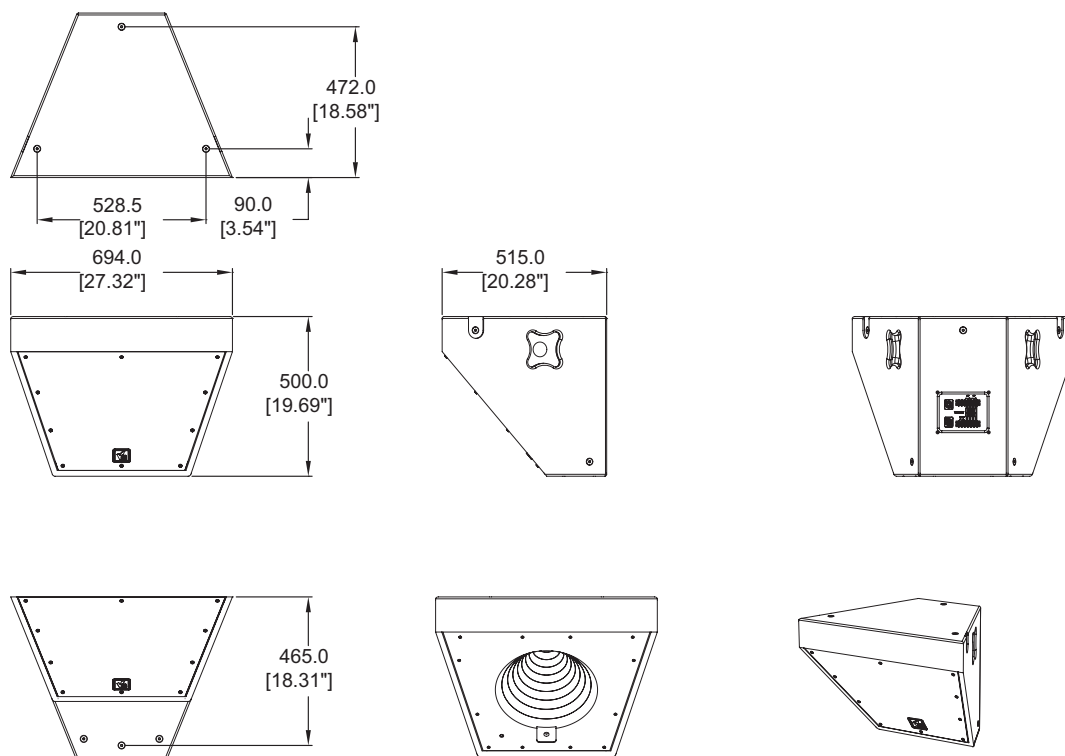
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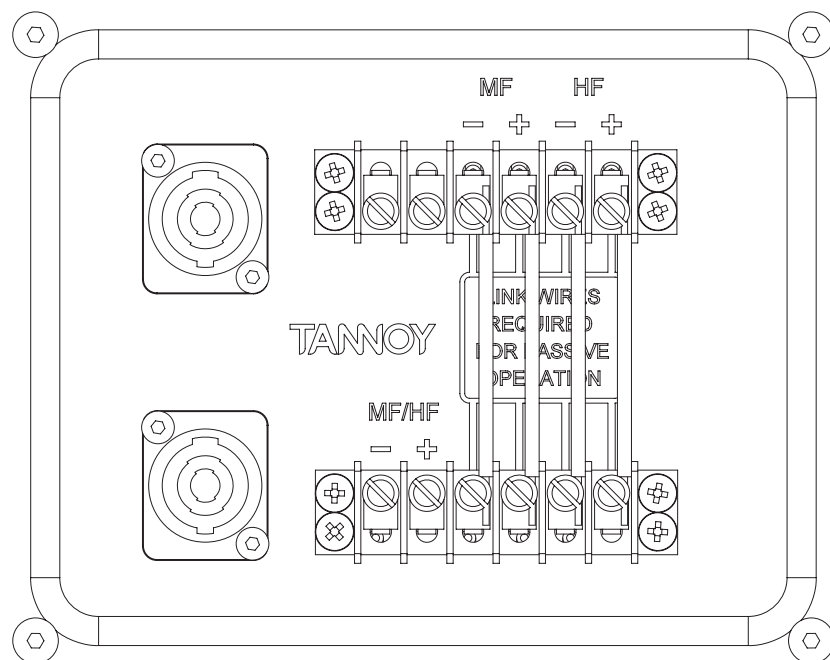
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## DIMENSIONAL SKETCHES



## INPUT PANEL



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## Architectural specifications

The loudspeaker shall consist of a Dual Concentric™ Compression driver with a 3.5" Midrange voice coil and a 2" High Frequency voice coil, both mounted in a common subsystem with a common 2" exit. This Dual Concentric™ compression driver shall be coupled to a PSW™ (Point Source Waveguide) constant directivity horn operating over the frequency range of 400Hz to 23kHz. The loudspeaker shall be user configurable for Bi-Amp operation via the rear input panel. The loudspeaker shall be trapezoidal in shape.

Performance of the loudspeaker, using the recommended electronic control shall meet or exceed the following criteria:

In Bi-amp mode the Mid/High section shall produce a sound pressure level of 112dB SPL on axis at 1 meter with a power input of 1 Watt, and shall be capable of producing a peak output of 141dB SPL on axis at 1 meter. In Bi-amp mode the Mid/High section shall handle 400 Watts of amplifier power and shall have a nominal impedance of 8 Ohms. The High Frequency section shall handle 180 Watts of amplifier power and shall have a nominal impedance of 8 Ohms. The dispersion of the loudspeaker shall be 40 degrees conical (-6dB). The enclosure shall be of birch plywood construction and internally braced. The enclosure shall be fitted with eight integral carrying handles, and twelve M10 inserts for flying hardware. The enclosure shall not exceed the following dimensions (H x W x D): 500 mm x 694 mm x 515 mm (19.69" x 27.32" x 20.5").

The loudspeaker shall be the Tannoy...VQ 40DF.

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